

THELESPERMA CAESPITOSUM (ASTERACEAE), A NEW
SPECIES FROM WYOMING AND UTAH

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ABSTRACT

Thelesperma caespitosum, a new species from Wyoming and Utah, is described and illustrated. The new species is a member of the *T. subnudum* complex and is compared to four related taxa. Possible evolution in the complex is discussed.

The Green River Formation in southwest Wyoming has always looked ideal to me as habitat for endemic species because of the extensive, barren, shale hills. Several endemics including *Lesquerella congesta* Rollins, *Lesquerella parviflora* Rollins, *Physaria obcordata* Rollins, and *Thalictrum heliophilum* Wilken & DeMott have been discovered recently on this formation in western Colorado, but none were previously found in Wyoming. In the spring of 1988 I encountered a small population of *Thelesperma* on this formation that I immediately recognized as different from known taxa in the genus.

***Thelesperma caespitosum* Dorn, sp. nov.** (Fig. 1)—TYPE: USA, Wyoming, Sweetwater Co., T18N R106W SE $\frac{1}{4}$ of SE $\frac{1}{4}$ of Sect. 31 and SW $\frac{1}{4}$ of SW $\frac{1}{4}$ of Sect. 32, 5 km SE of Green River, barren white shale ridge, 1890 m, 22 Jun 1988, *Dorn 4948* (holotype, RM; isotypes, to be distributed).

Perennis, radice lignosa, caudice ramoso, caulibus glabris 4–19 cm altis, foliis basalibus plerumque pinnatidivisis vel ternatidivisis, petiolis et interdum laminis ciliatis in marginibus, capitulis 1 vel raro 2, involucris 6–11 mm altis, ligulis nullis, corollis discis luteis (4–)5.5–9 mm longis, pappo nullo, achaeniis glabris (4–)4.8–7(–7.5) mm longis.

Perennial from a woody taproot and branched caudex that bears a dense series of persistent old leaf bases. Stems 4–19 cm high, glabrous, naked or with a few reduced leaves or bracts which are generally opposite below and alternate above. Leaves mostly basal, 1–6 cm long, pinnately or ternately divided into mostly 3–5 linear-elliptic segments which are sometimes again divided, segments mostly 1–2(–4) mm wide and 3–12(–18) mm long (or some leaves occasionally simple), glabrous except for ciliate petiole margins and sometimes blade margins (rarely entirely glabrous). Heads 1 or rarely 2; involucre 6–11 mm high, inner bracts with broad scarious margins, nearly free to connate about $\frac{1}{3}$ their length, outer bracts linear

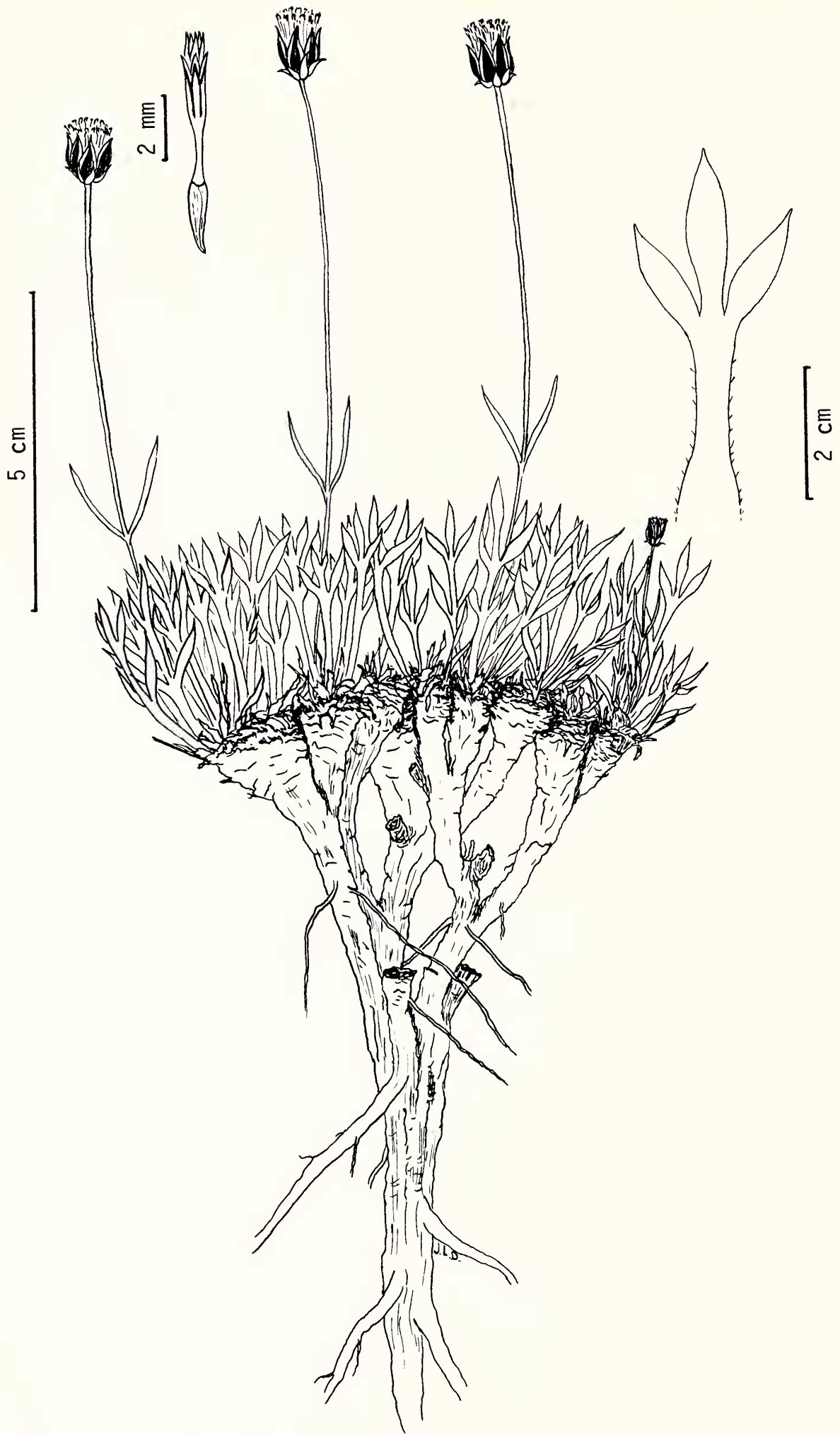


FIG. 1. *Thelesperma caespitosum* habit, flower, and leaf.

to lanceolate, about half as long as inner; ray flowers lacking; disk corollas yellow, (4–)5.5–9 mm long, with reddish-brown longitudinal veins that split at each corolla sinus and pair and meet with an adjacent vein at tip of corolla lobes, the lobes triangular and much shorter than throat; pappus lacking; achenes glabrous, mostly olive-brown, lance-linear and slightly curved, ridged on front and back faces and longitudinally striate, (4–)4.8–7(–7.5) mm long, each subtended by a longer membranous bract. Chromosome number unknown.

Paratypes. USA, Wyoming, same location as holotype, 31 May 1988, *Dorn 4941* (RM); Utah, Duchesne Co., SW of Duchesne, white shale benches, 1800 m, 15 Jun 1947, *Ripley and Barneby 8700* (NY).

Thelesperma caespitosum belongs to the *T. subnudum* complex which now consists of four species and one variety. Differences between the taxa are summarized in Table 1 and distribution of the taxa is shown in Figure 2. *Thelesperma subnudum* and *T. marginatum* are mostly tall, glabrous plants with relatively long and broad leaf segments, the rootstocks are somewhat creeping, and there are often several heads per stem. In contrast, *T. caespitosum* and *T. pubescens* are short plants with some pubescence, leaf segments are relatively short and narrow, the caudex is branched with a stout taproot, and there is usually 1(2) head per stem. The leaf pubescence in *T. caespitosum* is restricted to the petiole (rarely on lower blade), the herbage appears bright green in the field, and the achenes average 5 mm or more long [(4–)4.8–7(–7.5) mm]. In *T. pubescens*, the leaves are pubescent all over, the herbage often appears grayish in the field, and the achenes average less than 5 mm long [(3.8–)4–4.7(–5) mm]. *Thelesperma subnudum* var. *alpinum* seems to have evolved parallel to *T. caespitosum* and *T. pubescens* but has not diverged quite as far from *T. subnudum*. The divergence might be considered enough to warrant specific status, however. Since var. *alpinum* is the only member of the group for which I have no field experience, I hesitate to provide a definite opinion on its rank.

Thelesperma subnudum appears to be the ancestral species of the complex with its relatively widespread distribution, common habitat, mostly several heads per stem, and ray florets usually present. This likely gave rise to *T. marginatum* which also has a relatively widespread distribution but a more specialized habitat and a lack of ray florets. The two are now allopatric. *Thelesperma caespitosum* and *T. pubescens* may have evolved at the time *T. subnudum* and *T. marginatum* were diverging both geographically and genetically. More likely they were derived from *T. subnudum* at a later date. Their habitats are even more specialized than that of *T. marginatum*, their distribution is highly restricted, they have developed a much-branched caudex characteristic of desert vegetation, they have ac-

TABLE 1. SELECTED CHARACTERISTICS FOR TAXA OF THE *THELESPERMA SUBNUDUM* COMPLEX.

Species or variety	Leaf segments	Pubescence	Heads	Rootstock	Habitat	Distribution
<i>T. subnudum</i> A. Gray var. <i>subnudum</i>	long, broad	none	1-several, ligulate (discoid)	somewhat creeping	common, desert shrub	N AZ, N NM, UT, W & S CO
<i>T. marginatum</i> Rydb.	long, broad	none	1-several, discoid	somewhat creeping	specialized, rocky outwash	SE ALTA, SW SASK, MT, NW WY
<i>T. caespitosum</i> Dorn	short, narrow	on petioles (lower blade)	1(2), discoid	taproot, branched caudex	specialized, white shale	NE UT, SW WY
<i>T. pubescens</i> Dorn	short, narrow	on leaves	1(2), discoid	taproot, branched caudex	specialized, weathered conglomerate	SW WY
<i>T. subnudum</i> A. Gray var. <i>alpinum</i> Welsh	short, narrow	on leaves & lower stems	1(2), discoid	somewhat creeping to taproot & branched caudex	specialized, sandy?	SC UT

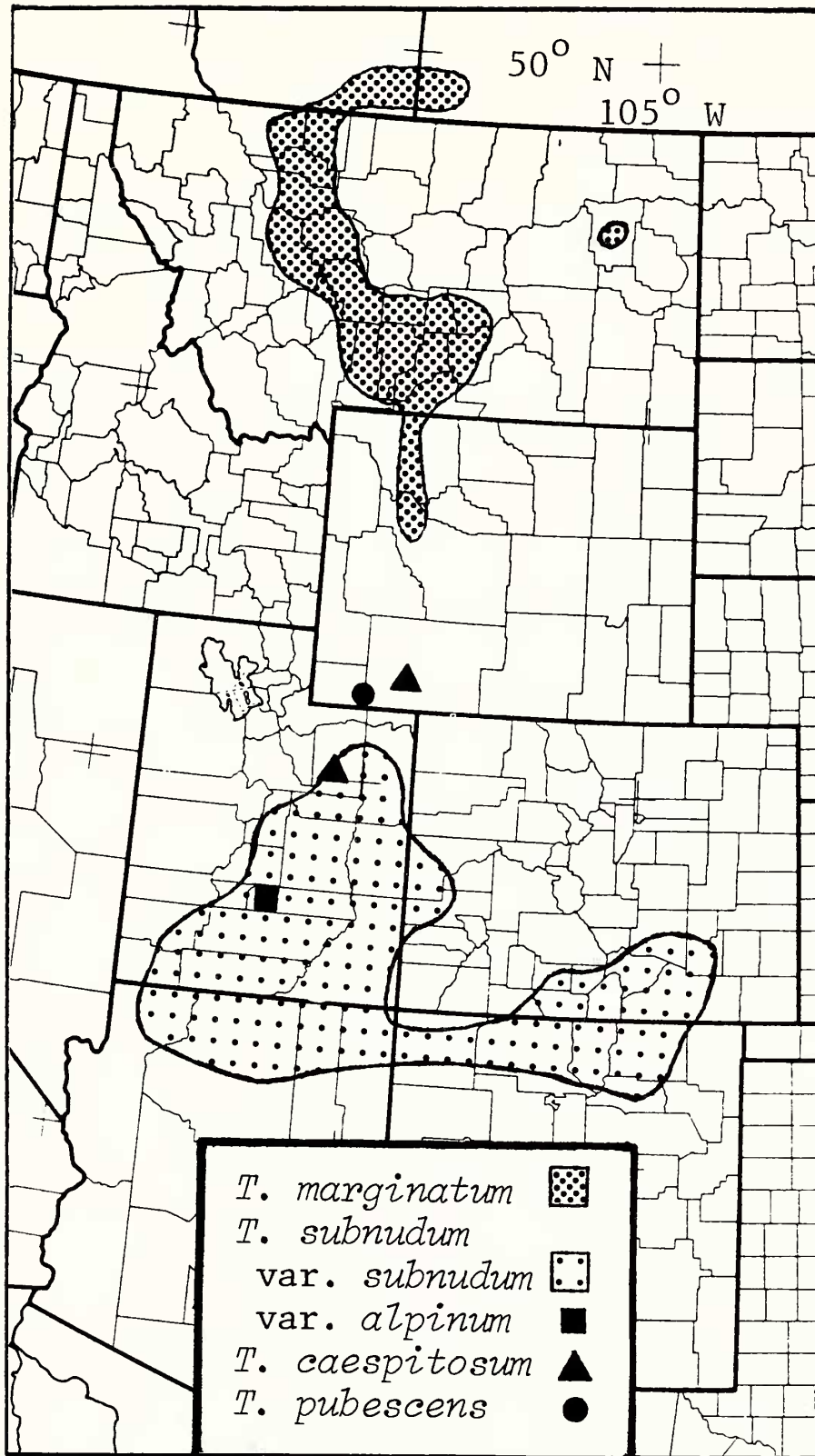


FIG. 2. Central and southern Rocky Mountain region of western North America showing distribution of taxa in the *Thelesperma subnudum* complex.

quired pubescence, the leaves have been reduced, and the heads have been reduced to one or rarely two per stem. It is likely that *T. pubescens* arose from *T. caespitosum* or vice-versa, or they may have arisen simultaneously from *T. subnudum*. *Thelesperma subnudum*

var. *alpinum* appears to be a later derivative parallel to *T. pubescens* and *T. caespitosum*, but it is not yet as stable as these taxa. Narrow endemics in this region tend to exploit severe habitats where there is little or no competition, and that is the pattern followed by *T. pubescens* and *T. caespitosum* and to a lesser extent by *T. subnudum* var. *alpinum*. In most cases, these endemics appear to be relatively recently evolved rather than relicts as reflected in their specialized adaptations for coping with a severe environment. Older environments were more moderate.

KEY TO TAXA IN THE *THELESPERMA SUBNUDUM* COMPLEX

- A. Plants usually glabrous; heads 1 to several per stem; rootstock somewhat creeping, lacking a much branched caudex with persistent old leaf bases.
 - B. Heads with both ray and disk flowers, rays rarely lacking; Arizona, New Mexico, Utah, and Colorado *T. subnudum* A. Gray var. *subnudum*
 - B' Heads with only disk flowers, rays lacking; Alberta, Saskatchewan, Montana, and NW Wyoming *T. marginatum* Rydb.
- A' Plants pubescent at least on petioles (very rarely glabrous); heads 1 or rarely 2 per stem; rootstock generally with a much branched caudex with many persistent old leaf bases.
 - C. Flower stems pubescent at least on lower portion; SC Utah *T. subnudum* A. Gray var. *alpinum* Welsh
 - C' Flower stems glabrous; NE Utah and SW Wyoming.
 - D. Leaves pubescent throughout *T. pubescens* Dorn
 - D' Leaves pubescent only on petioles (rarely on lower blade) *T. caespitosum* Dorn

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